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Notice of Allowability	Application No.	Applicant(s)	
	10/649,286	DONNELLY ET AL.	
	Examiner	Art Unit	
	Bentsu Ro	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to applicant's amendment filed 3/31/2005.
2. ☒ The allowed claim(s) is/are 1-5, 8-26 and 38-51.
3. ☒ The drawings filed on 31 March 2005 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying Indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>3/31/05</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

Bentsu Ro
Bentsu Ro
Primary Examiner

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows:


- Claim 39, line 7, after the word "traction" insert --motor--.
- Claim 43, line 15, at the end of this line, change the period (.) to comma (,).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bentsu Ro whose telephone number is 571 272-2072. The examiner can normally be reached on WS08605.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on 571 272-2107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

4/21/2005


Bentsu Ro
Senior Examiner
Art Unit 2837

Please enter the Examiner's Amendment.

Thanks. Ro 4/21/2005

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Claim 39.

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Reply to Office Action of Dec. 6, 2004

Amendment dated Mar. 31, 2005

5 a plurality of direct current traction motors corresponding to a plurality of axles and
a plurality of drive switches; and

10 a plurality of free-wheeling bypass circuits, each bypass circuit bypassing a
corresponding one of the plurality of plurality of drive switches, wherein each of the plurality
of drive switches is operable to pulse power sequentially to each of the traction motors
produce a selected power requirement for each traction motor during a selected time interval,
15 wherein the pulse width is varied depending on a measured characteristic of the respective
traction motor, wherein each of the plurality of drive switches is operable to pulse power
sequentially to each of the traction motors produce a selected power requirement for each
traction motor during a selected time interval, wherein the pulse width is varied depending
on a measured characteristic of the respective traction motor wherein the pulses to each of
15 the traction motors are time sequenced such that a time separation between adjacent pulses
to different traction motors is at least substantially maximized, and wherein the measured
characteristic is an electrical current supplied to each traction motor.

39. (New) The locomotive of claim 38, further comprising:

5 a controller operable to (a) determine the power requirement for each motor at each
of a number of successive time intervals; (b) determine the necessary voltage and pulse width
to achieve the desired power for each motor; and (c) sequentially pulse power to each of the
motors for a duration necessary to achieve the power requirement at each successive time
interval, wherein, during a selected time interval, a first traction motor receives a first power
pulse and a second different traction ^{motor} receives a second power pulse and wherein the first and
second power pulses have differing magnitudes. ←

40. (New) The locomotive of claim 38, further comprising:

a plurality of chopper circuits corresponding to the plurality of direct current traction
motors, each chopper circuit comprising a respective free-wheeling bypass circuit and drive
switch in electrical communication with a respective direct current traction motor, wherein,

Claim 43.

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drive switch and the corresponding one or more traction motors and bypasses the corresponding free-wheeling bypass circuit; and

15 during a selected time interval, operating at least one of the traction motors in the first mode and a different at least one of the traction motors in the second mode/ 3 ←
wherein the at least one chopper circuit is operable to pulse power sequentially to each of the traction motors produce a selected power requirement for each traction motor during a selected time interval, wherein the pulse width is varied depending on the measured characteristic of the respective traction motor, wherein, for each motor, the frequency of
20 pulses is maintained at least substantially constant, and wherein the pulses to each of the traction motors are time sequenced such that a time separation between adjacent pulses to different traction motors is at least substantially maximized.

44. (New) The method of claim 43, further comprising:

determining the power requirement for each motor at each of a number of successive time intervals;

determining the necessary pulse width to achieve the desired power for each motor;

5 and

sequentially pulsing each of the motors for a duration necessary to achieve the power requirement at each successive time interval.

45. (New) The method of claim 44, wherein, during a selected time interval, a first traction motor receives a first power pulse and a second different traction receives a second power pulse and wherein the first and second power pulses have differing magnitudes.

46. (New) The method of claim 45, wherein the first and second power pulses are nonoverlapping.